Tidal Freshwater Rappahannock River Total Maximum Daily Load Study

Public Meeting
Fredericksburg, Virginia
June 20, 2007

Meeting Agenda

- **Project Background Information**

  Katie Conaway, VA Department of Environmental Quality

- **Bacteria Source Assessment and TMDL Development**

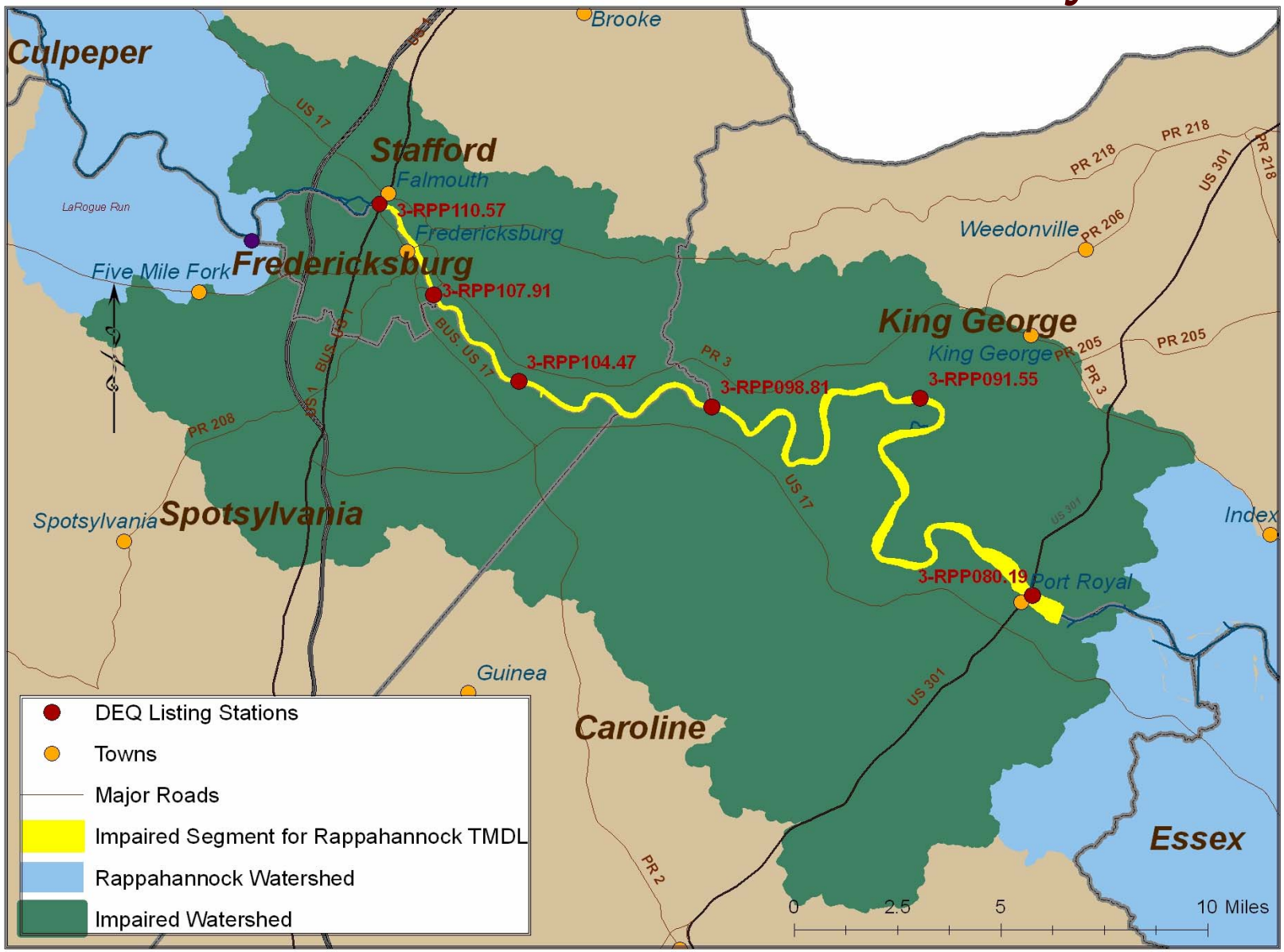
  Raed El-Farhan, The Louis Berger Group, Inc.

- **Questions**

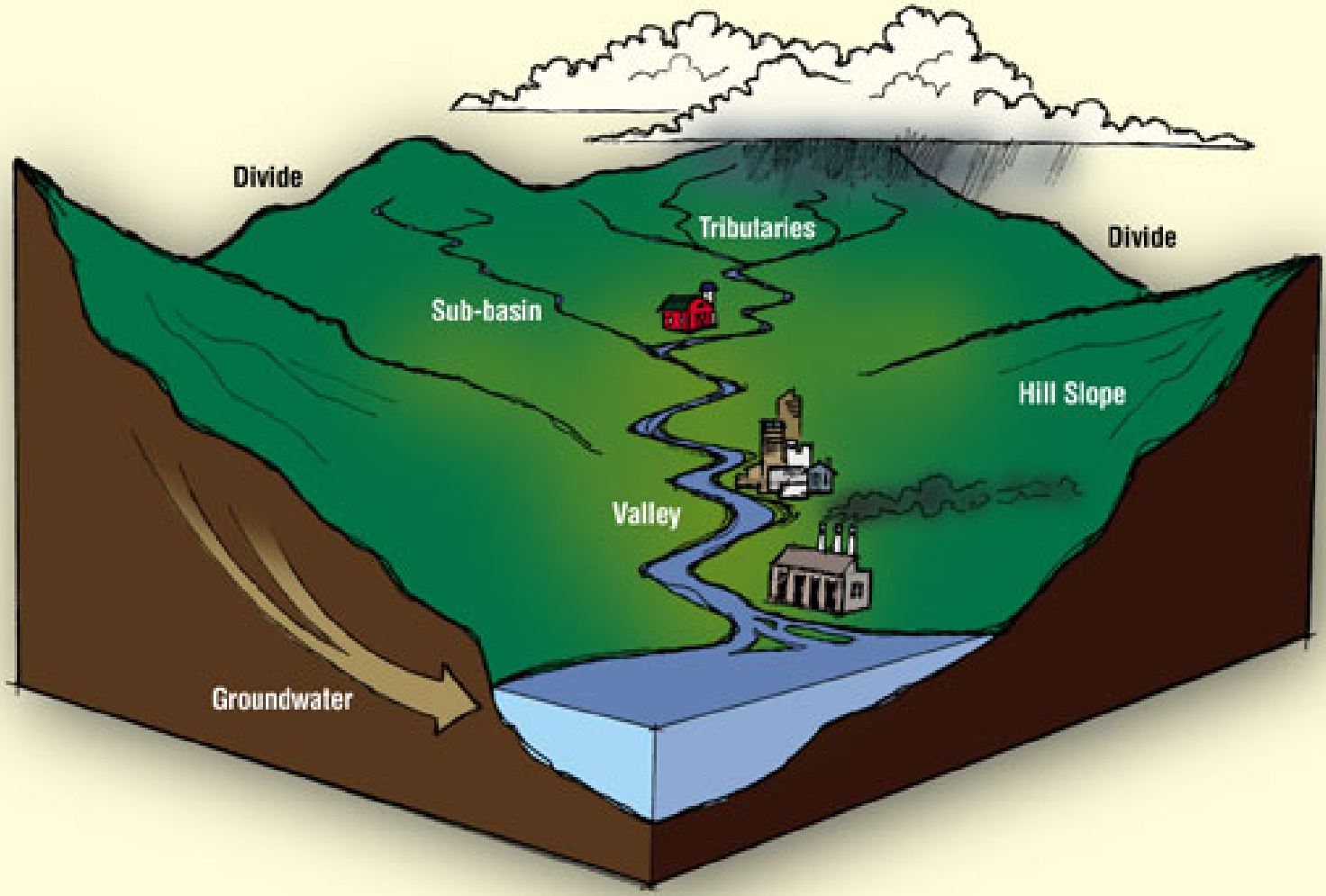
Why are we here?

- Learn about water quality in the tidal, freshwater portion of the Rappahannock River.
- Explain efforts that Virginia is undertaking to improve and protect water quality.

What part of the Rappahannock River is addressed in this study?



What is a watershed?



Water Quality in the Rappahannock River

- Portions of the Rappahannock River are not meeting the state water quality standard for the recreational use.
- The purpose of the water quality standards is to protect the following six designated uses:

- Recreational
- Aquatic Life
- Public Water Supply
- Wildlife
- Fish Consumption
- Shellfish

How do you know the recreation use isn't being met?

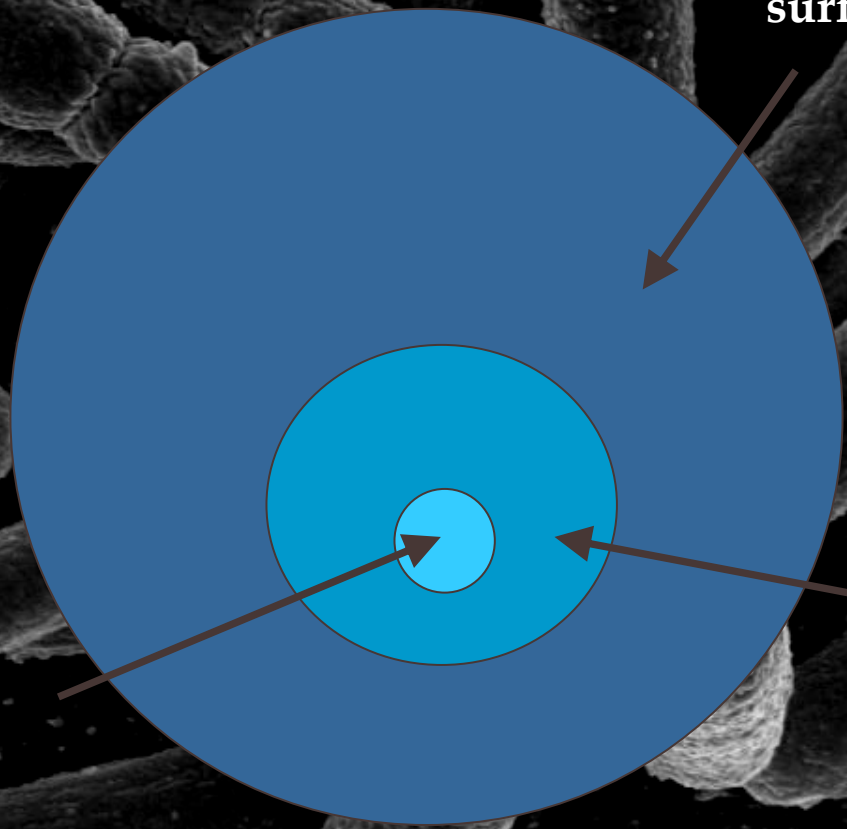
- Monitor the Rappahannock River to determine levels of bacteria present in the water.
- Compare bacteria monitoring data to state water quality standards.
- State Criteria for Bacteria (for individual samples):

Fecal Coliform Bacteria: 400 cfu/100 mL E. Coli Bacteria: 235 cfu/100 mL

If greater than 10.5% of the samples exceed the water quality standards, and you have 2 or more samples, the stream is listed as impaired.

What are Fecal Coliform Bacteria and *E. Coli* Bacteria?

Coliform Bacteria: Commonly found in soil, decaying vegetation, animal feces, and raw surface water.



Fecal Coliform:

- Found in the digestive tract of humans and warm blooded animals.
- Indicator of the potential presence of pathogens in water bodies.

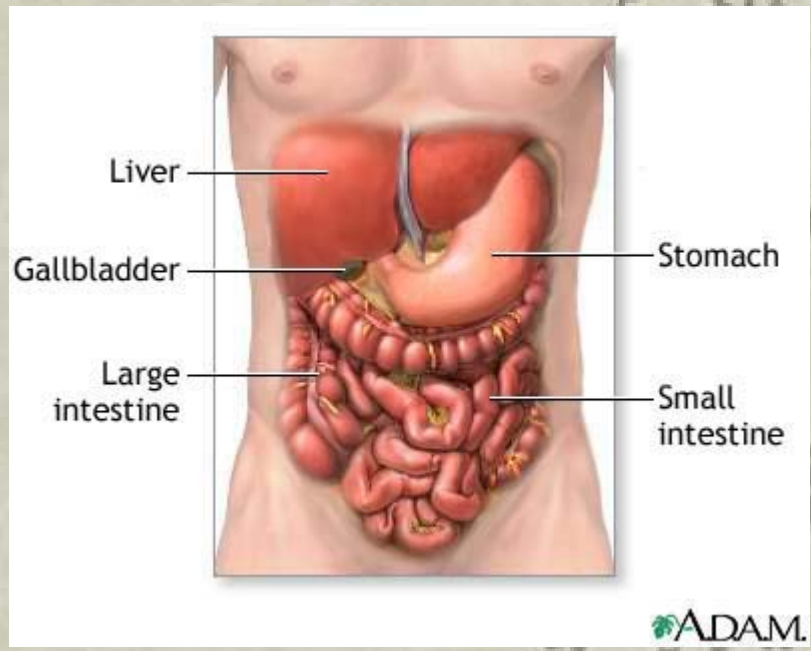
Escherichia coli:

- subset of fecal coliform bacteria.
- Correlate better with swimming associated illness.

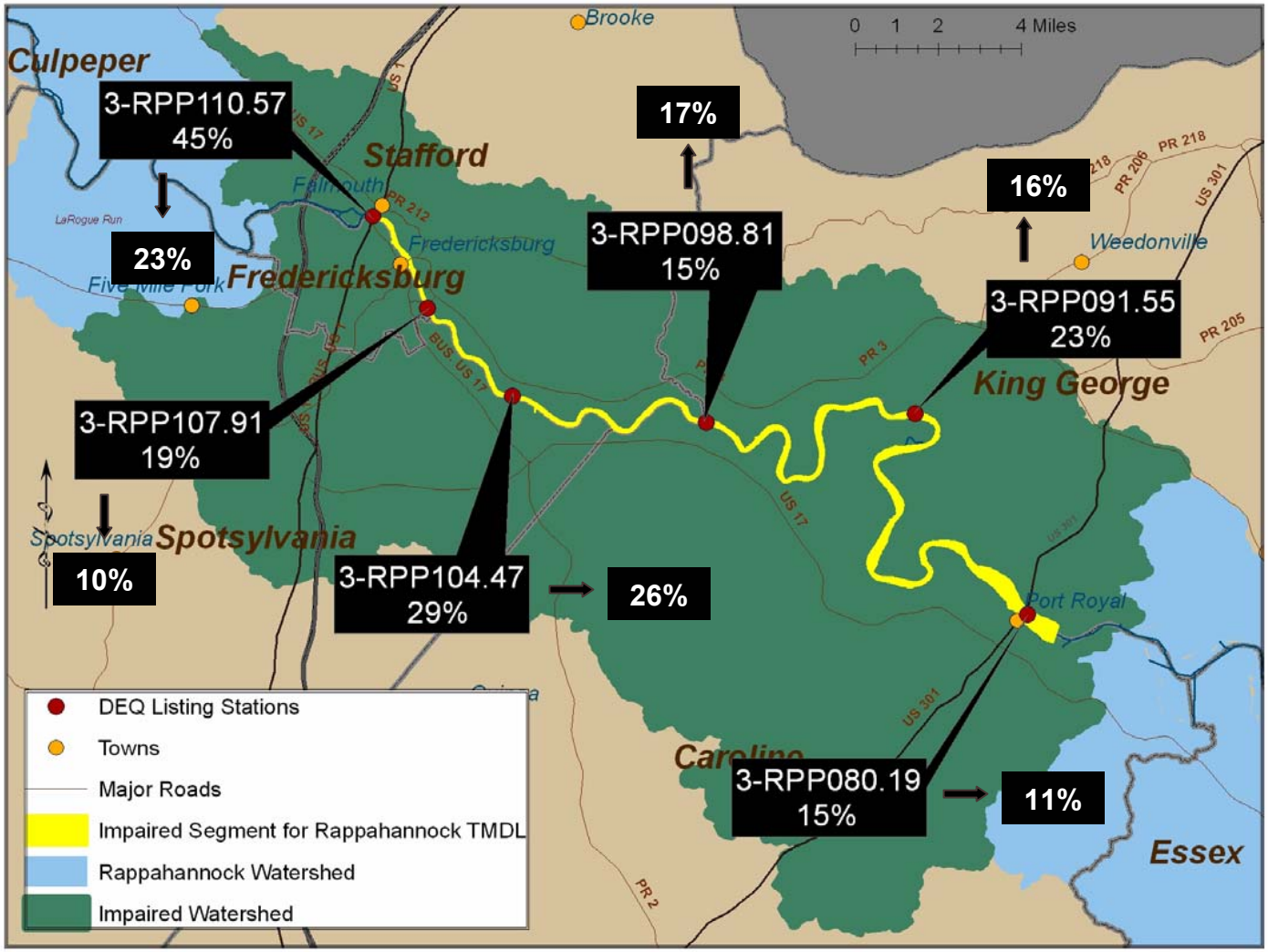
Potential Sources of Fecal Coliform Bacteria

Why are high levels of Fecal coliform Bacteria bad?

- Presence of fecal coliform bacteria indicate that other disease causing bacteria may be present.
- Pose a human health concern – chance of gastrointestial illness or infections during primary contact (getting water in mouth, nose, eyes, or open wounds).



Bacteria Exceedance Rates in the Rappahannock River (1/1/2000 to 12/31/2004)



So the Rappahannock River doesn't meet water quality standards, now what?

- The portion of the Rappahannock that doesn't meet the bacteria water quality standard is listed as "impaired."
- Once a water body is listed as impaired, law* requires us to perform a Total Maximum Daily Load Study.

*Clean Water Act (1972)
*Water Quality Monitoring, Information, and Restoration Act (1997)

What is a TMDL ?

Total Maximum Daily Load

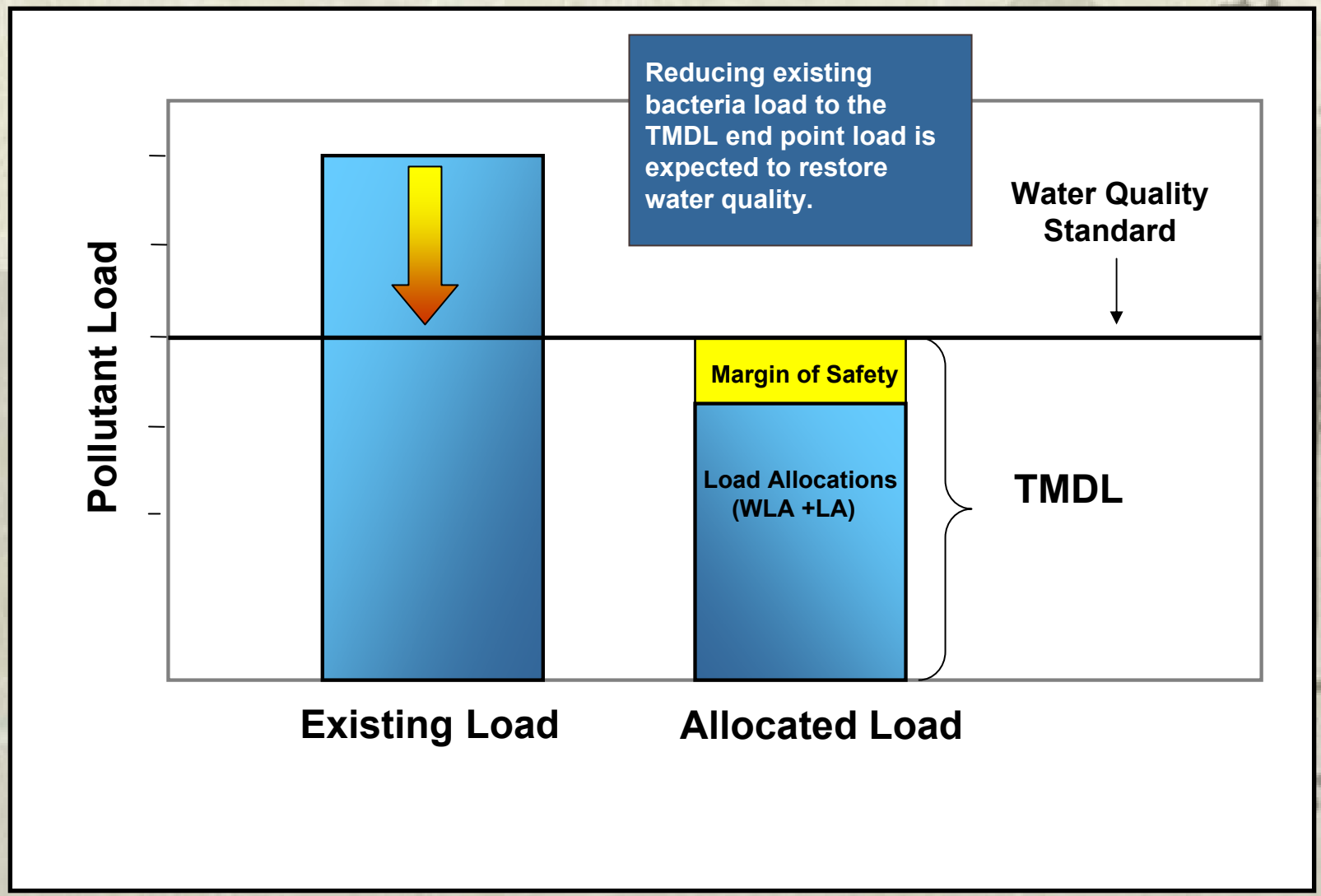
TMDL = Sum of WLA + Sum of LA + MOS

Where:

TMDL = Total Maximum Daily Load
WLA = Waste Load Allocation (point sources)
LA = Load Allocation (nonpoint sources)
MOS = Margin of Safety

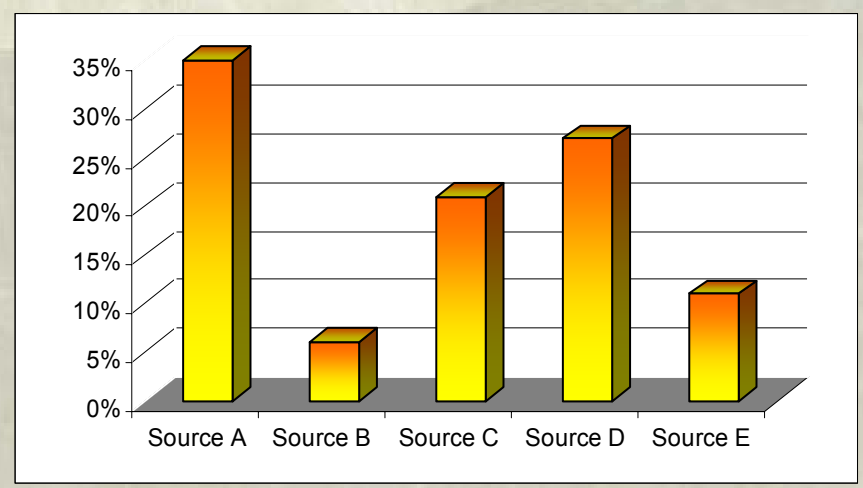
A TMDL is the amount of a particular pollutant that a stream can receive and still meet Water Quality Standards.

An Example TMDL



TMDL Development Methodology

1. Identify all sources of bacteria in the watershed.

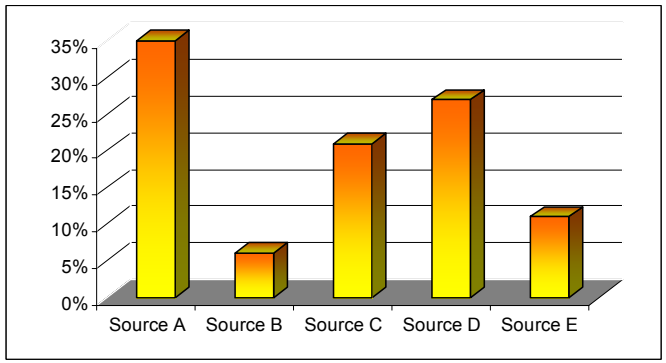


2. Determine which sources contribute the most bacteria.

3. Enter data into a computer model. Use the model to determine how much each source needs to be reduced.

We are here

TMDL Study

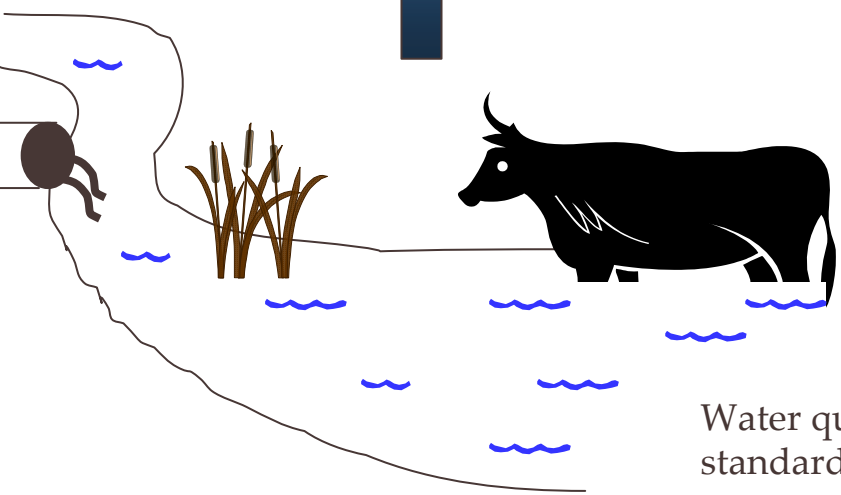


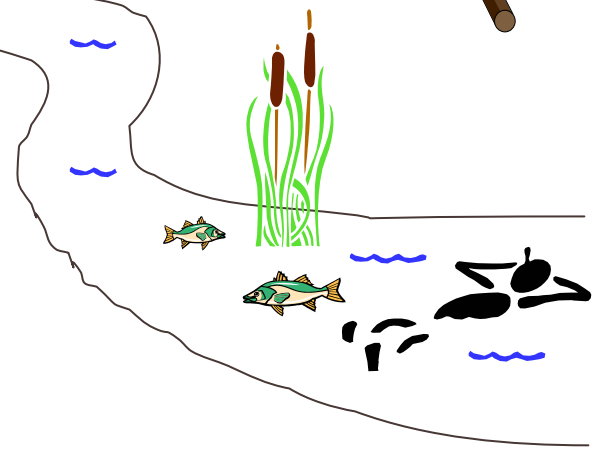
Implementation Plan

DCR

Implementation

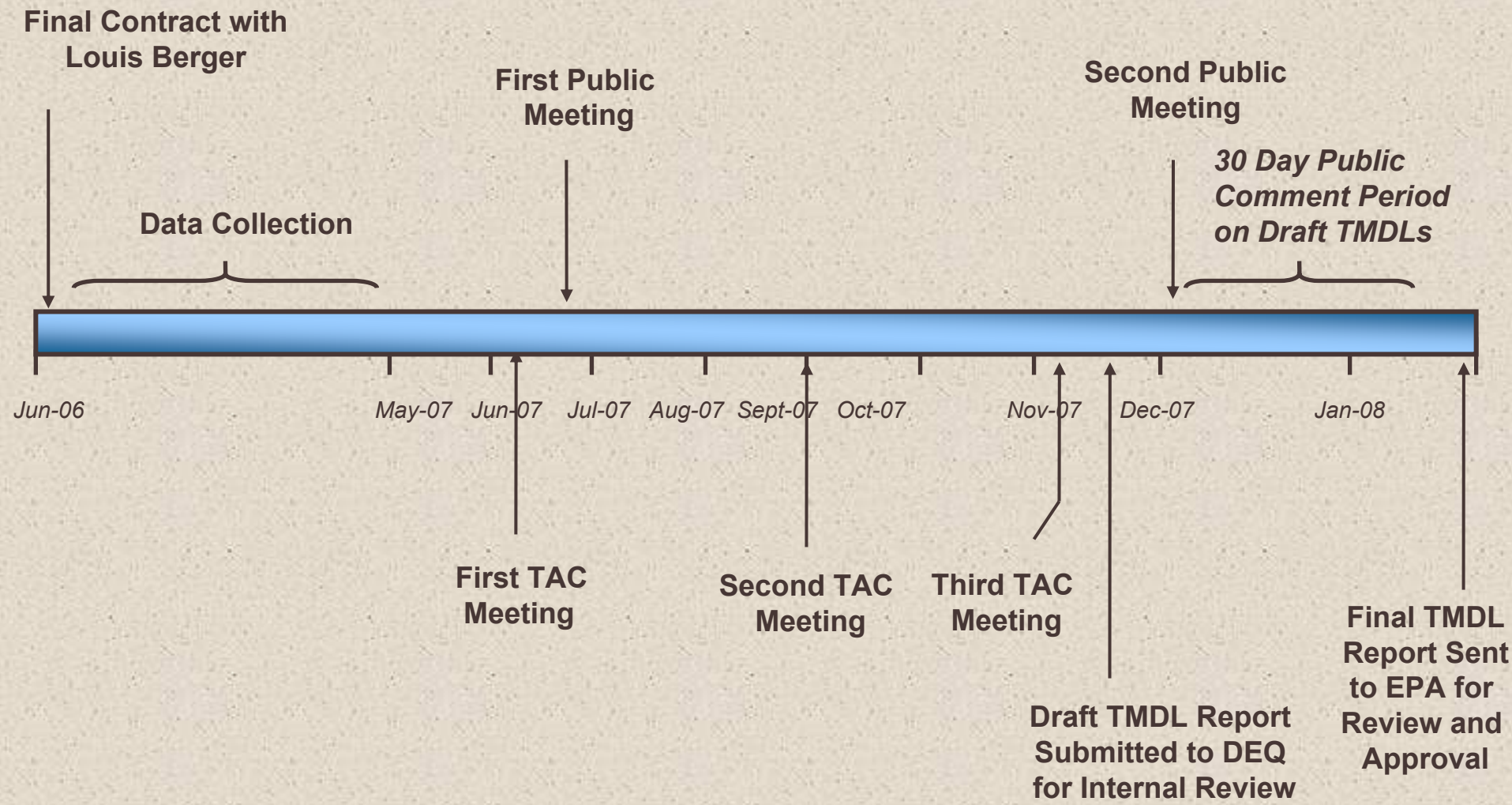
Monitoring





Water quality standards not met

Tidal Freshwater Rappahannock Bacteria TMDL Project Milestones



Comments? Feedback?

- Public Comment Period for this meeting extends from June 20, 2007 to July 20, 2007.
- All comments should be in writing. Please send them to:

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Additional Information

What are the Exceedance Rates for Rappahannock River?

Monitoring Station	Station Location	Exceedance Rate Recorded for the 2006 Assessment (01/01/2000 – 12/31/2004)	
		Fecal Coliform	E. Coli
3-RPP110.57	Route 1 Bridge	6 of 13 samples (46.2%)	5 of 11 samples (45.4%)
3-RPP107.91	One hundred yards below the Fredericksburg Wastewater Treatment Facility	3 of 16 samples (18.8%)	N/A
3-RPP104.47	100 yards below the Massaponax Creek Wastewater Treatment facility	N/A	2 of 7 samples (28.6%)
3-RPP098.81	Buoy 112	N/A	2 of 13 samples (15.4%)
3-RPP091.55	Buoy 89	N/A	3 of 13 samples (23.1%)
3-RPP080.19	Route 301 Bridge	N/A	2 of 14 samples (14.3%)


Culpeper
Brooke
0 1 2 4 Miles
US 17
Stafford
Falmouth
3-RPP110.57
LaRogue Run
Fredericksburg
PR 218
Weedonville
PR 206
US 301
Five Mile Fork
VA0086789
VA0086720
VA0025127
3-RPP107.91
King George
King George
VA0068110
PR 205
PR 3
VA0088374
VA0090654
VA0091600
VA0076392
VA0025658
3-RPP098.81
VA0089338
3-RPP091.55
VA0087645
VA0060429
PR 208
VA0068934
VA0090468
US 17
VA0089125
Spotsylvania
Spotsylvania
VA0067326
3-RPP080.19
Port Royal
US 301
Caroline
VA0032034
Essex
PR 2
Bowling Green
DEQ Listing Stations
Towns
Major Roads
Impaired Segment for Rappahannock TMDL
Rappahannock Watershed
Impaired Watershed
VPDES Permits

How do we know if water bodies in Virginia are healthy?

- **Perform physical and chemical monitoring on water bodies throughout the state.**
- **Monitor parameters such as:**

  - **pH**
  - **Temperature**
  - **Dissolved Oxygen**
  - **Health of Biological Community**
  - **Bacteria**
  - **Nutrients**
  - **Fish Tissue**
  - **Metals/Toxic Pollutants**